AMENDMENT TO THE CLAIMS

Claims 23-74 are currently pending in the application. Claims 23, 31, 43, 48, 56, and 61 are currently amended to correct some minor clerical issues, without acquiescence in the cited basis for rejections or prejudice to pursue the original claims in a related application. A complete listing of the pending claims is provided below and supersedes all previous listing(s) of claims. No new matter has been added.

1-22   (Canceled)

23.   (Currently Amended) A computer implemented method of handling document operation requests and storing results of document operations requests in a volatile or non-volatile computer readable medium, the method comprising:

receiving a document operation request, the document operation requiring one or more collection elements within the document to be in a computer-readable memory, wherein the one or more collection elements are designated to be part of the collection with a markup language;

identifying at least one of the one or more collection elements for processing;

determining whether the at least one of the one or more collection elements is in the computer-readable memory by using a processor;

identifying a collection partition which comprises the at least one of the one or more collection elements, wherein the collection partition comprises a subset of the one or more collection elements in the document;

loading the collection partition into the computer-readable memory based on a result from the act of determining, wherein

the at least one of the one or more collection elements is loaded into the computer-readable memory when the at least one of the one or more collection elements is not in the computer-readable memory, and

another collection partition and a data which is used to manage respective collection

elements of the another collection partition are removed from the computer-

readable memory after a change in one or more of the respective collection

elements of the another collection partition is persisted in a second computer-

readable memory where there is insufficient space for loading the collection

partition; and

executing the document operation with the collection partition and displaying a result of

the act of executing the document operation on a display apparatus or storing the

result in a storage device or a tangible computer-readable memory.

24.   (Previously Presented) The method of claim 23, wherein the collection partition does not exceed a threshold size.

25.   (Previously Presented) The method of claim 24, wherein the threshold size is a factor of the memory size.

26.   (Previously Presented) The method of claim 24, wherein the threshold size is user defined.

27.   (Previously Presented) The method of claim 23, wherein the memory is fixed in size.

28.   (Previously Presented) The method of claim 23, wherein the collection partition is a unit in which data is written to or read from a data storage device.

29.   (Previously Presented) The method of claim 23, wherein the collection partition comprises collection elements from one collection.

30.   (Previously Presented) The method of claim 23, wherein the collection partition is a disjoint subset of a collection in the document.

31.   (Currently Amended) The method of claim 23, wherein loading the at least one identified collection element into memory comprises:

loading the at least one identified collection element into a ~~Previously Presented~~ new

collection partition in the memory when the at least one identified collection element

is not in the memory.

32.   (Previously Presented) The method of claim 23, further comprising:

determining whether the memory is full;

selecting one or more collection partitions in the memory for removal when the memory
is full;

propagating one or more changes in each of the one or more selected collection partitions
to one or more data storage devices storing one or more collection elements in the
selected collection partition;

removing the one or more selected collection partitions from the memory; and

updating one or more collection partitions that remain in the memory.

33.   (Previously Presented) The method of claim 32, wherein the memory is full when the
memory is above a threshold.

34.   (Previously Presented) The method of claim 33, wherein the threshold is user defined.

35.   (Previously Presented) The method of claim 32, wherein selecting one or more collection
partitions in the memory for removal comprises:

selecting one or more least recently used collection partitions in the memory for removal
when the memory is full.

36.   (Previously Presented) The method of claim 32, wherein updating one or more collection
partitions comprises:

updating metadata corresponding to the one or more collection partitions that remain in
the memory.

37.   (Previously Presented) The method of claim 32, wherein the one or more selected
collection partitions do not contain any of the one or more required collection elements.

38.   (Previously Presented) The method of claim 23, wherein the document operation is a
read, update, delete, insert, or create operation.

39.   (Previously Presented) The method of claim 23, wherein the one or more required
collection elements are part of one collection.

40.   (Previously Presented) The method of claim 23, wherein determining whether the at least one identified collection element is in the memory comprises:

> determining whether a collection partition corresponding to the at least one identified collection element has already been loaded into memory.

41.   (Previously Presented) The method of claim 40, wherein loading the at least one identified collection element into memory comprises:

> loading the corresponding collection partition into memory when the corresponding collection partition has not already been loaded into memory.

42.   (Previously Presented) The method of claim 23, wherein the document is an XML document.

43.   (Currently Amended) A computer program product that includes a computer readable medium, the computer readable storage medium being a non-volatile medium or a volatile medium, the computer readable storage medium comprising a plurality of instructions which, when executed by a processor, ~~causes~~ cause the processor to execute a process for handling document operation requests, the process comprising:

> receiving a document operation request, the document operation requiring one or more collection elements within the document to be in a computer-readable memory, wherein the collection comprises a set of collection elements designated to be part of the collection with a markup language;
>
> identifying at least one of the one or more collection elements for processing;
>
> determining whether the at least [[one]]one or more collection elements is in the computer-readable memory by using [[a]]the processor;
>
> identifying a collection partition which comprises the at least one of the one or more collection elements, wherein the collection partition comprises a subset of the one or more collection elements in the document;
>
> loading the collection partition into the computer-readable memory based on a result from the act of determining, wherein

the at least one of the one or more collection elements is loaded into the computer-readable memory when the at least one of the one or more collection elements is not in the computer-readable memory, and

another collection partition and a data which is used to manage respective collection elements of the another collection partition are [[are]]removed from the computer-readable memory after a change in one or more of the respective collection elements of the another collection partition is persisted in a second computer-readable memory where there is insufficient space for loading the collection partition; and

executing the document operation with the collection partition and displaying a result of the act of executing the document operation on a display apparatus or storing the result in a storage device or a tangible computer-readable memory.

44.   (Previously Presented) The computer program product of claim 43, wherein the collection partition does not exceed a user-defined threshold size.

45.   (Previously Presented) The computer program product of claim 43, wherein the memory is fixed in size.

46.   (Previously Presented) The computer program product of claim 43, wherein the collection partition is a unit in which data is written to or read from a data storage device.

47.   (Previously Presented) The computer program product of claim 43, wherein the collection partition is a disjoint subset of a collection in the document.

48.   (Currently Amended) The computer program product of claim 43, wherein loading the at least one identified collection element into memory comprises:

loading the at least one identified collection element into a ~~Previously Presented~~ new collection partition in the memory when the at least one identified collection element is not in the memory.

49.   (Previously Presented) The computer program product of claim 43, wherein the process further comprises:

determining whether the memory is full;

selecting one or more collection partitions in the memory for removal when the memory is full;

propagating one or more changes in each of the one or more selected collection partitions to one or more data storage devices storing one or more collection elements in the selected collection partition;

removing the one or more selected collection partitions from the memory; and

updating one or more collection partitions that remain in the memory.

50.   (Previously Presented) The computer program product of claim 49, wherein the memory is full when the memory is above a user-defined threshold.

51.   (Previously Presented) The computer program product of claim 49, wherein selecting one or more collection partitions in the memory for removal comprises:

selecting one or more least recently used collection partitions in the memory for removal when the memory is full.

52.   (Previously Presented) The computer program product of claim 49, wherein updating one or more collection partitions comprises:

updating metadata corresponding to the one or more collection partitions that remain in the memory.

53.   (Previously Presented) The computer program product of claim 43, wherein the document operation is a read, update, delete, insert, or create operation.

54.   (Previously Presented) The computer program product of claim 43, wherein determining whether the at least one identified collection element is in the memory comprises:

determining whether a collection partition corresponding to the at least one identified collection element has already been loaded into memory.

55.   (Previously Presented) The computer program product of claim 54, wherein loading the at least one identified collection element into memory comprises:

loading the corresponding collection partition into memory when the corresponding collection partition has not already been loaded into memory.

56.   (Currently Amended) A system for handling document operation requests, the system comprising:

means for receiving a document operation request, the document operation requiring one or more collection elements within the document to be in a computer-readable memory, wherein the collection comprises a set of collection elements designated to be part of the collection with a markup language;

means for identifying at least one of the one or more collection elements for processing;

~~means~~ a processor configured for determining whether the at least one of the one or more collection elements is in the computer-readable memory, ~~wherein the means for determining comprises a processor~~;

means for identifying a collection partition which comprises the at least one of the one or more collection elements, wherein the collection partition comprises a subset of the one or more collection elements in the document;

means for loading the collection partition into memory based on a result from the act of determining, wherein

the means for loading loads the at least one of the one or more collection elements into the computer-readable memory when the at least one of the one or more collection elements is not in the computer-readable memory, and

another collection partition and a data which is used to manage respective collection elements of the another collection partition are removed from the computer-readable memory after a change in one or more of the respective collection elements of the another collection partition is persisted in a second computer-readable memory where there is insufficient space for loading the collection partition; and

means for executing the document operation with the collection partition and a display

apparatus configured for displaying a result of the executing the document operation

or a storage device or a tangible computer-readable memory for storing the result.

57.   (Previously Presented) The system of claim 56, wherein the collection partition does not exceed a user-defined threshold size.

58.   (Previously Presented) The system of claim 56, wherein the memory is fixed in size.

59.   (Previously Presented) The system of claim 56, wherein the collection partition is a unit in which data is written to or read from a data storage device.

60.   (Previously Presented) The system of claim 56, wherein the collection partition is a disjoint subset of a collection in the document.

61.   (Currently Amended) The system of claim 56, wherein means for loading the at least one identified collection element into memory comprises:

means for loading the at least one identified collection element into a ~~Previously Presented~~ new collection partition in the memory when the at least one identified

collection element is not in the memory.

62.   (Previously Presented) The system of claim 56, further comprising:

means for determining whether the memory is full;

means for selecting one or more collection partitions in the memory for removal when the memory is full;

means for propagating one or more changes in each of the one or more selected collection partitions to one or more data storage devices storing one or more collection elements in the selected collection partition;

means for removing the one or more selected collection partitions from the memory; and

means for updating one or more collection partitions that remain in the memory.

63.   (Previously Presented) The system of claim 62, wherein the memory is full when the memory is above a user-defined threshold.

64.   (Previously Presented) The system of claim 62, wherein means for selecting one or more collection partitions in the memory for removal comprises:

> means for selecting one or more least recently used collection partitions in the memory for removal when the memory is full.

65.   (Previously Presented) The system of claim 62, wherein means for updating one or more collection partitions comprises:

> means for updating metadata corresponding to the one or more collection partitions that remain in the memory.

66.   (Previously Presented) The system of claim 56, wherein the document operation is a read, update, delete, insert, or create operation.

67. . (Previously Presented) The system of claim 56, wherein means for determining whether the at least one identified collection element is in the memory comprises:

> means for determining whether a collection partition corresponding to the at least one identified collection element has already been loaded into memory.

68.   (Previously Presented) The system of claim 67, wherein means for loading the at least one identified collection element into memory comprises:

> means for loading the corresponding collection partition into memory when the corresponding collection partition has not already been loaded into memory.

69.   (Previously Presented) The method of claim 23, in which the collection partition is defined by a partitioning function.

70.   (Previously Presented) The method of claim 69, in which the partitioning function comprises a hash-based partitioning function or a range-based partitioning function.

71.   (Previously Presented) The computer program product of claim 43, in which the collection partition is defined by a partitioning function.

72.   (Previously Presented) The computer program product of claim 71, in which the partitioning function comprises a hash-based partitioning function or a range-based partitioning function.

73.   (Previously Presented) The system of claim 56, in which the collection partition is defined by a partitioning function.

74.   (Previously Presented) The system of claim 73, in which the partitioning function comprises a hash-based partitioning function or a range-based partitioning function.